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ORIGINAL ARTICLE

Factors That Affect Functional Capacity in Patients With Musculoskeletal Pain: A Delphi Study Among Scientists, Clinicians, and Patients

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ABSTRACT. Lakke SE, Wittink H, Geertzen JH, van der Schans CP, Reneman MF. Factors that affect functional capacity in patients with musculoskeletal pain: a Delphi study among scientists, clinicians, and patients. Arch Phys Med Rehabil 2012; 93:446-57.

Objective: To reach consensus on the most important biopsychosocial factors that influence functional capacity results in patients with chronic nonspecific musculoskeletal pain, arranged in the framework of the *International Classification of Functioning, Disability and Health*.

Design: Three-round, internet-based Delphi survey.

Setting: Not applicable.

Participants: Participants were scientists, clinicians, and patients familiar with functional capacity testing. Scientists were invited through purposive sampling based on the number of relevant publications in peer-reviewed journals. The scientists recruited clinicians and patients through snowball sampling.

Interventions: Not applicable.

Main Outcome Measures: Consensus was reached if at least moderate influence (25%) was achieved and an interquartile range of no more than 1 point was reached.

Results: Thirty-three scientists, 21 clinicians, and 21 patients from 9 countries participated. Participants reached consensus on 6 factors that can influence the outcome of the lifting test, having a median of severe influence (50%–95%): catastrophic thoughts and fear, patient adherence to "doctor's orders," internal and external motivation, muscle power, chronic pain behavior, and avoidance behavior. Motivation, chronic pain behavior, and sensation of pain were the top 3 factors affecting postural tolerance and repetitive movement functional capacity tests. Furthermore, participants reported 28 factors having a median of moderate influence (25%–49%) that could influence the outcome of lifting, postural tolerance, and repetitive movement tests.

Conclusions: Overall, chronic pain behavior, motivation, and sensation of pain are the main factors that can influence functional capacity results. We recommend that scientists and clinicians, respectively, consider the most important factors when planning future studies and when interpreting functional capacity test results.

Key Words: Delphi technique; Lifting; Rehabilitation; Work capacity evaluation.

IN CLINICAL PRACTICE, functional capacity (FC) tests, such as lifting, postural tolerance, and repetitive movement tests, are used to assess work-related functioning in patients with chronic nonspecific musculoskeletal pain (MSP). FC test results help clinicians to guide work-related rehabilitation and return-to-work decisions. If FC is determined to be insufficient in relation to the workload, factors responsible for a deficit must be identified. Scientists have studied a broad range of factors that may influence FC. Investigated factors include fear of movement, pain intensity, depression, sex, age, workers' compensation, previous episodes of pain, self-reported disability, and self-efficacy.[1-13] However, to date, no framework for classifying potentially influencing factors has been applied. Thus, there is a need to organize possible influencing factors into a framework.

The International Classification of Functioning, Disability and Health (ICF) is such a framework (fig 1).[14] The ICF provides a scientific basis and a common language for understanding functioning, and it can be used as a conceptual framework to measure relationships between ICF factors.[14] The ICF has been used to describe the interaction between ICF factors in several chronic health conditions.[15-20] FC is classified in the Activity component of the ICF (see fig 1).[14] The ICF also contains a Body Function and Structures component and a Participation component, both of which describe factors that can influence FC. Other factors that might hinder or facilitate FC are Personal and Environmental factors.

Experts in the field of FC evaluation (FCE) have agreed on adopting the ICF as a framework.[21] The ICF describes some 1700 factors. The overwhelming number of categories makes it difficult for clinicians to decide on a hypothesis about factors that can influence FC test results. Unanimity among scientists and clinicians on a set of factors that potentially influence FC is crucial. In future studies, this set of factors should be included to ensure comparability among

List of Abbreviations

FC	functional capacity
FCE	functional capacity evaluation
ICF	International Classification of Functioning, Disability and Health
MSP	musculoskeletal pain

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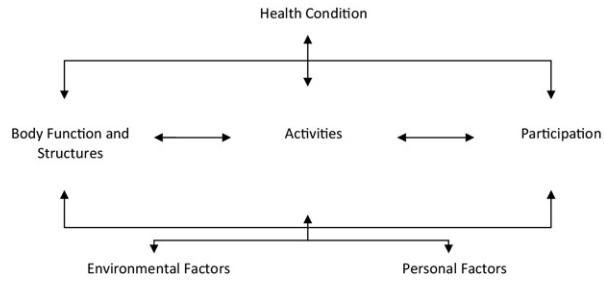

Fig 1. The International Classification of Functioning, Disability and Health. (From World Health Organization. International classification of functioning, disability and health: ICF. Geneva: World Health Organization; 2001.)

studies. In patients scoring lower or higher than expected, such a set of factors limits the number of ICF factors that a clinician has to consider. FCEs are used by clinicians worldwide and may influence decisions on whether patients with chronic nonspecific MSP can work. Thus, it is of high clinical relevance that a universal set of factors on FC become available.

After the experts agreed to use the ICF as a framework for FCE,[21] the next methodological step was to include related factors into this framework, which then could be tested scientifically. Thus, the aim of this study was to identify the most pertinent biopsychosocial factors that influence FC in patients with chronic nonspecific MSP.

METHODS

Design

A Delphi study was performed from May to July 2010. The Delphi technique is a structured process whereby experts reveal and share their opinion anonymously with other experts.[22-24] During several rounds, the experts get insight into group opinions, and based on the group's answers, they might reconsider their answers until they reach consensus.[25-27]

Participants

Evidence-based practice decisions are based on 3 domains: scientific research, individual clinical expertise, and individual patient characteristics.[28] With this principle in mind, we included scientists, clinicians, and patients in this study (table 1).

Table 1: Inclusion Criteria

1	Scientists who published in peer-reviewed international journals in the field of capacity testing in patients with musculoskeletal pain, the author was listed either at least once as a first author and once as a coauthor, or at least 3 times as a second or last author.
2	Clinicians who had conducted at least 30 capacity tests in patients with chronic nonspecific MSP, whereby these capacity tests contained lifting and/or postural tolerance and/or repetitive movements.
3	Patients with chronic nonspecific MSP who underwent a capacity test that included lifting and/or postural tolerance and/or repetitive movements no more than 3 months before the survey.

Fig 2. Three functional capacity tests.

"Nonspecific" MSP was defined as musculoskeletal system pain (muscles, bones, and cartilage) not attributed to recognizable, known specific pathology. Pain was defined as "chronic" if there was a minimum of 3 months since the initiation of pain. To ensure that only full- and part-time workers, not casual workers, were included in the study, we had to verify that all participating patients with chronic nonspecific MSP had worked a minimum of 20h/wk on a regular basis. We selected 3 FCE items to represent 3 aspects of FC (peak, duration, and repetition): lifting, postural tolerance, and repetitive movements (fig 2).

Procedure

Selection of participants and recruitment. Before this study, a workgroup of scientific and clinical experts from different countries gathered in Glasgow, Scotland, at the 2008 12th World Congress on Pain to discuss the importance of agreeing on factors that influence FC. Scientists and clinicians attending this meeting were invited to participate in our study. In addition, we performed an electronic search of bibliographic literature databases (MEDLINE, CINAHL, EMBASE, and PsychINFO) to identify other scientists who met our inclusion criteria (see table 1). Next, the included scientists were asked to recruit clinicians and patients with chronic nonspecific MSP through snowball sampling. To determine whether a candidate met the inclusion criteria, we invited each potential participant and sent a link to a web-based questionnaire assessing their eligibility to participate.[29] All participants signed an informed consent form. We guaranteed anonymity by assigning a unique Delphi number to each participant.

This Delphi study consisted of 3 rounds (fig 3).

First round. The aim of the first round was to gather and define as many factors as possible. All 3 expert groups—scientists, clinicians, and patients—were invited to participate in this round. We used a web-based survey.[29] Participants were asked to liberally report as many factors as possible that, in their opinion, could influence FC. Because patients most likely lacked knowledge of medical terminology, we provided them with a separate lay version of this survey written in English.

In our first round analysis, an independent secretary gathered the questionnaire results and sent the anonymous responses to 2 authors (H.W. and S.E.L.) who have expert knowledge of the ICF. First, they aggregated the responses if possible. Second, they classified the responses according to ICF categories using ICF-linking rules (table 2).[30-32] A consensus meeting took place to resolve any disagreements. If no consensus could be reached, a third assessor (M.F.R.) made the final decision.

Second round. The aim of the second round was to reduce the number of first-round factors to form a comprehensive, succinct set of factors. The list of factors and their definitions

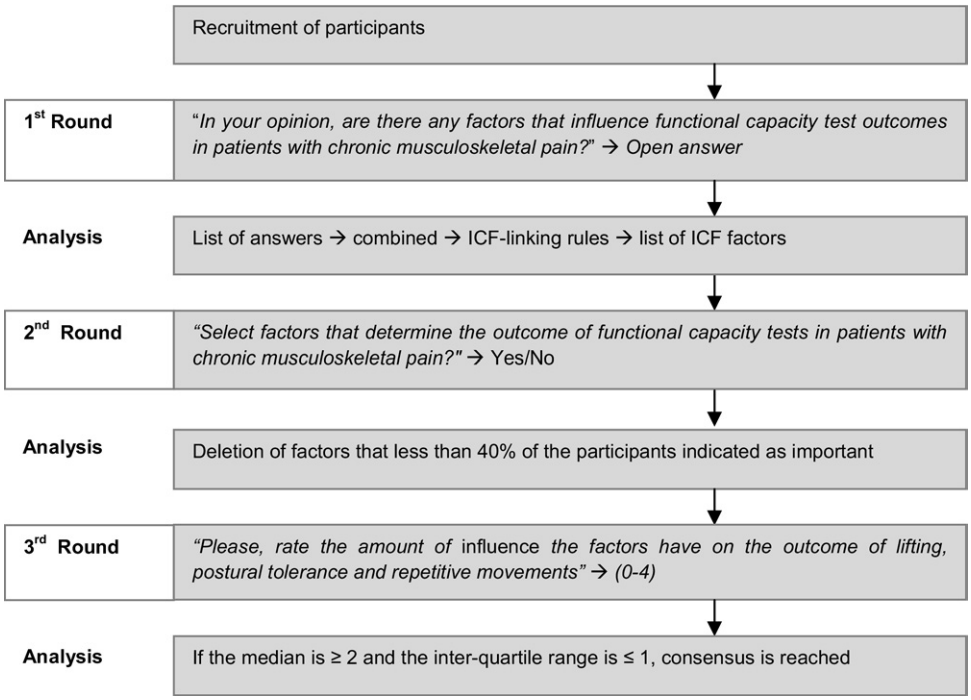

Fig 3. Structure of the Delphi process.

was sent to the scientists and clinicians in the second and third round. We asked them to select the factors that, in their opinion, should be included in the comprehensive set: "Select as many factors as needed and at the same time as few as possible." Participants rated each factor on a dichotomous scale (yes/no).

In our second round analysis, we removed the factors that were deemed unimportant by 60% or more of the participants in the second round.

Third round. The aim of the third round was to reach consensus. Scientists and clinicians rated the potential influence of the factors on 3 FC tests: lifting, postural tolerance, and repetitive movements. The degree of influence was quantified using a 5-point Likert scale (table 3). This scale and its wording are based on the ICF.[14] The scale reflects the extent to which a factor potentially influences FC at the group level.

In our third round analysis, we calculated the median, mean, and interquartile range of each factor. The criterion of consensus was based on the agreement among participants and the degree of influence. To reach consensus, 2 criteria had to be reached. First, the interquartile range had to be no more than 1 point. Second, minimum influence on FC test outcome was required. We set the minimum criteria for influence at a moderate level of 25%. A factor rated below 25% indicated that it had little to no influence on FC test outcome.[14,33] The agreed-on factors then were ranked according to their means. Because the backgrounds of the scientists and clinicians may have differed, we calculated the differences between their opinions. If the opinions of scientists and clinicians differed by 1 point on the median and scored an interquartile range of 1 point, we analyzed the differences using the Mann-Whitney test. Additionally, we described the agreed-on factors that influenced all 3 FC tests.

Table 2: ICF-Linking Rules

1	Each answer was linked to the most precise ICF category.
2	If 1 answer encompassed different constructs, the information in each construct was linked.
3	If the content of an answer was not explicitly named in the corresponding ICF category but at the same time was included in the ICF category, then the answer was linked to this ICF category, and the additional information not explicitly named by the ICF was documented.
4	If the content of an answer was more general than the corresponding ICF category, the code of the higher level was linked.
5	If the information provided by the answer was not sufficient for making a decision about the most appropriate ICF category, then this factor was linked "nd" (not definable).
6	If an answer was not covered in the ICF classification, then this item was assigned "nc" (not covered by the ICF).

Data from references 30-32.

Table 3: Extent of Influence Conforming to the ICF

Quantification Number	Appropriate Qualifying Words	Extent of Influence (%)
0 No influence	None, absent, negligible	0–4
1 Mild influence	Slight, low	5–24
2 Moderate influence	Medium, fair	25–49
3 Severe influence	High, extreme, strong	50–95
4 Complete influence	Total	96–100

Data from reference 14.

Table 4: Characteristics of Participants

Characteristics	Scientists	Clinicians	Patients
No. of participants			
1st Round	33 (14M, 19W)	21 (8M, 13W)	21 (7M, 14W)
2nd Round	30	18	0
3rd Round	32	18	0
Age (y)	44.7±9.7	45.4±8.3	45.5±10.7
Country			
Canada	6	1	0
The Netherlands	13	5	5
Australia	4	4	8
United States	1	7	4
Germany	3	0	2
Finland	1	0	0
Norway	3	1	0
Switzerland	1	3	2
United Kingdom	1	0	0

NOTE. Values are n or mean ± SD.
Abbreviations: M, men; W, women.

RESULTS

Participants

Through the electronic database search, we identified 30 scientists in addition to the 26 Glasgow group members. The authors of the present article were excluded from participation. In April 2010, we invited the scientists to participate in this study and to complete the web-based inclusion criteria questionnaire.[29] Thereafter, the scientists made great efforts to recruit other participants, resulting in a sample of 33 scientists, 21 clinicians, and 21 patients from 9 countries and 41 institutions worldwide (table 4).

First Round

The 2 authors who analyzed the responses to the online survey differed on their classification of the following factors: depression, fear-avoidance behavior, motivation of test evaluator, support of the tester, time of day, job satisfaction, and health beliefs that load is risky. During the consensus meeting, the analyzers agreed to link these 7 factors according to the way other ICF experts linked them.[17,18] This resulted in a total of 126 factors.

Second Round

The second round took place in June 2010. Eleven percent of participants did not respond because of personal reasons. The participants advised us to remove 2 parts: chapter 4 of the ICF Activities and Participation component, because these activities are similar to our FC tests, and the ICF Body Structures component, because anatomic body parts are not influencing factors. This reduction and combination of factors resulted in a comprehensive set of 79 factors.

Third Round

Two scientists who did not participate in the second round participated in the third round, resulting in a response rate of 93%.

Factors that have strong influence. Scientists and clinicians reached consensus on 6 factors that influence lifting with a median of severe influence of 50% to 95% (table 5). These 6 factors were all linked to the ICF Body Function component. The participants did not reach consensus on factors that strongly influenced the postural tolerance and repetitive movement tests.

Factors that have moderate influence. Consensus was reached on another 28 factors with a median of moderate influence of 25% to 49% (see table 5). The definitions of these factors and their ICF linking are described in appendix 1. Factors that influenced the outcome of all 3 tests—lifting, postural tolerance, and repetitive movements—are described in table 6. For clarification, we entered the factors of severe and moderate influence into the ICF model (fig 4).

Scientists rated the influence of age on lifting ($U=190.00$, $P<.05$) and on repetitive movements ($U=169.5$, $P<.02$) 1 point higher than clinicians. There were no other significant differences between the rating scores of the scientists and clinicians.

DISCUSSION

The aim of the present study was to identify a set of factors that exert the most influence on FC in patients with chronic nonspecific MSP. We used the ICF during the Delphi process as a framework to obtain consistent language and to classify the factors mentioned by the participants. Both scientists and clinicians benefited from using a tool for promoting consistent language. The participants reached consensus on a set of 37 factors that could influence FC by at least 25%. Of the 37 factors, 6 were considered to have a high level of influence (50%–95%) on lifting (see table 5). The factor "catastrophic thoughts and fear" was ranked as exerting the highest effect on lifting, as reflected by the highest median. However, previous studies[9,34-36] revealed that this factor contributed only modestly to static lifting ($.05 \leq R^2 < .25$). Moreover, conflicting evidence exists in the literature on what extent catastrophic thoughts and fear affects dynamic lifting.[5,7-10,37] The results of this Delphi study and the conflicting evidence indicate that more research is needed on catastrophic thoughts and fear in relation to dynamic lifting.

The factor "patient adherence to 'doctor's orders'" was ranked as having the second highest effect on FC. To our knowledge, no FC research on this factor exists. Thus, further research is recommended. The factors "motivation," "chronic pain," and "avoidance behaviors" also were ranked as having a strong influence on lifting. Further research on instruments that measure motivation and avoidance behavior is recommended. "Muscle power" was ranked as having the fourth highest effect on FC. To our surprise, the relationship between muscle power and capacity tests has not been studied in patients with chronic nonspecific MSP, even though strength training is regularly advised in patients with low-capacity results. Overall, we advise clinicians to consider these 6 factors if a patient scores lower than expected on a lifting test.

With respect to factors that could affect postural tolerance and repetitive movements tests, participants reached only a moderate level of consensus on factors embodied by the fear-avoidance model, such as fear, chronic pain behavior, and avoidance behavior. This suggests that these concepts influence these 2 FC tests to a lesser degree than lifting tasks. Furthermore, participants classified patient adherence and motivation as having less influence on postural tolerance and repetitive movements than on lifting tasks. We advise conducting further research on this pattern.

Motivation, chronic pain behavior, and sensation of pain were ranked as the top 3 factors to influence the outcome of all 3 capacity tests. To date, no study of which we are aware has evaluated the direct influence of motivation on FC. Chronic pain behavior is defined as any and all outputs of the individual that a reasonable observer would characterize as suggesting

Table 5: Factors That Influence FC Tests With a Median of 3 (Severe Influence) or 2 (Moderate Influence) and an Interquartile Range of 1 Point

FC Test	Rank	Factor	Mean	ICF Category
Median=3 (50%–95% influence)				
Lifting	1	Catastrophic thoughts and fear of reinjury, pain, movement, activities, exacerbating symptoms	2.7	b152
	2	Patient adherence to "doctor's orders"	2.6	b126
	3	Motivation, internal and external	2.6	b1303
	4	Muscle power	2.5	b730
	5	Chronic pain behavior	2.5	b164
	6	Avoidance behavior	2.4	b164
Postural tolerance	NA	None		
Repetitive movements	NA	None		
Median=2 (25%–49% influence)				
Lifting	7	Previous experiences with pain, injuries, acceptance, activity limitations after previous capacity test, previous behavior of another person in pain	2.4	pf
	8	Sensation of pain	2.3	b280
	9	Individual attitude toward pain and/or capacity test	2.3	pf
	10	Similarity of capacity test with activities at work	2.2	d850
	11	Beliefs or expectancies regarding return to work	2.2	pf
	12	Anxiety	2.2	b152
	13	Self-efficacy regarding capacity test	2.1	pf
	14	Illness beliefs	2.1	pf
	15	Location of pain	2.1	nc
	16	Multiple morbidity	2.0	nd
	17	Aerobic capacity functions	1.9	b4551
	18	Muscle endurance	1.9	b740
	19	Test evaluator gives support and relationship	1.8	e355
	20	Locus of control (internal/external)	1.8	pf
	21	Suffering	1.8	b152
	22	Attitudes of health professionals, including the test evaluator	1.7	e450
	23	Emotional functions related to work	1.7	b152
	24	Cognition or knowledge or understanding of injury process, recovery, pain and disability	1.7	b164
	25	Gender	1.7	pf
	26	Age	1.7	pf
	27	Presence of an observer like family, friends, or supervisor during the test	1.7	nc
	28	Sports	1.7	d920
	29	Joint stability	1.7	b715
	30	Numbers of days sick leave	1.6	nc
Postural tolerance	1	Motivation, internal and external	2.4	b1303
	2	Chronic pain behavior	2.3	b164
	3	Sensation of pain	2.2	b280
	4	Self-efficacy regarding capacity test	2.0	pf
	5	Avoidance behaviors	1.9	b164
	6	Similarity of capacity test with activities at work	1.9	d850
	7	Multiple morbidity	1.8	nd
	8	Coping style/maladaptive coping strategies	1.8	pf
	9	Location of pain	1.8	nc
	10	Fatigue	1.8	b4552
	11	Test evaluator gives support and relationship	1.7	e355
	12	Awareness of consequences of the test	1.7	b164
	13	Anxiety	1.7	b152
	14	Attitudes of health professionals, including the test evaluator	1.7	e450
	15	Locus of control (internal/external)	1.7	pf
	16	Type of personality (lazy, active)	1.7	pf
	17	Suffering	1.6	b152
	18	Test evaluator's expertise	1.6	nc

Table 5: Factors That Influence FC Tests With a Median of 3 (Severe Influence) or 2 (Moderate Influence) and an Interquartile Range of 1 Point (Cont'd)

FC Test	Rank	Factor	Mean	ICF Category
	19	Presence of an observer like family, friends, or supervisor during the test	1.6	nc
	20	Number of days sick leave	1.5	nc
	21	Emotional functions related to work	1.5	b152
Repetitive movements	1	Motivation, internal and external	2.5	b1303
	2	Chronic pain behavior	2.4	b164
	3	Sensation of pain	2.2	b280
	4	Previous experiences with pain, injuries, acceptance, activity limitations after previous capacity test, previous behavior of another person in pain	2.2	pf
	5	Catastrophic thoughts and fear of reinjury, pain, movement, activities, exacerbating symptoms	2.2	b152
	6	Individual attitude toward pain and/or capacity test	2.2	pf
	7	Beliefs or expectancies regarding return to work	2.2	pf
	8	Similarity of capacity test with activities at work	2.1	d850
	9	Self-efficacy regarding capacity test	2.0	pf
	10	Multiple morbidity	1.9	nd
	11	Location of pain	1.9	nc
	12	Type of personality (lazy, active)	1.9	pf
	13	Coping style/maladaptive coping strategies	1.9	pf
	14	Anxiety	1.8	b152
	15	Test evaluator gives support and relationship	1.8	e355
	16	Awareness of consequences of the test	1.8	b164
	17	Locus of control (internal/external)	1.7	pf
	18	Coordination	1.7	b7601
	19	Sincerity	1.7	b126
	20	Attitudes of health professionals, including the test evaluator	1.7	e450
	21	Presence of an observer like family, friends, or supervisor during the test	1.7	nc
	22	Muscle power	1.6	b730
	23	Aerobic capacity functions	1.6	b455
	24	Sports	1.6	d920
	25	Number of days sick leave	1.5	nc
	26	Age	1.5	pf

Abbreviations: b, body functions; d, activities and participation; e, environmental factors; NA, not applicable; nc, not covered; nd, not definable; pf, personal factors.

pain.[38,39] One of these outputs might be submaximal physical output during testing. Some authors have described and tested observational criteria to differentiate between maximal and submaximal effort during a lifting test,[40-42] whereas others have measured chronic pain behavior with a standardized observational scale.[43,44] To objectively judge patients' capacity scores, we advise clinicians to use observational pain behavior assessment tools.

Study Limitations

One methodological issue that might have caused sampling bias was the snowball style of participant recruitment, whereby participating scientists subsequently invited clinicians and patients. We relied on the scientists to verify inclusion criteria pertaining to the clinicians and their patients. The English language used in this study might have also caused sampling bias against recruiting participants, especially patients from the 5 non–English-speaking countries. There was a tradeoff in using multiple versus single language tests. We discussed the pros and cons of multiple language questionnaires during the preparation of this study and came to the conclusion that combining and defining translated constructs would create greater bias.

Another possible limitation might be the relatively large proportion of scientists in our study sample. We addressed this problem by analyzing the group of scientists and the group of clinicians separately, which resulted in only 1 factor, age, that scored significantly higher in the scientist group. In healthy populations, age does indeed influence lifting[45]; however, in populations with chronic low back pain, age seems to have no influence.[2,6,8,10,37,46] Lastly, some expert clinicians might have been inadvertently excluded if their working environment did not have an invited scientist who could have recruited them. Overall, in our view, the worldwide generalizability of this study outweighed any limitations resulting from possible sampling biases.

Another study limitation might be validity.[47] Validity of the set of factors can be measured by assessing the stability of the responses between the second and third Delphi rounds. In this study, validity was 62%, which was considered to be moderate.[48] Some factors were combined on the

Table 6: Factors Indicated by Participants to Potentially Influence All 3 Capacity Tests

ICF Component	Definition	ICF Category
Body function	Motivation, internal and external	b1303
	Chronic pain behavior	b164
	Sensation of pain	b280
	Anxiety	b152
Activities and participation	Similarity of capacity test with activities at work	d850
Environmental factors	Test evaluator gives support and relationship	e355
	Attitudes of health professionals, including the test evaluator	e450
Personal factors	Self-efficacy regarding capacity test	pf
Not covered	Location of pain	nc
	Numbers of days sick leave	nc
Not definable	Multiple morbidity	nd

Abbreviations: b, body functions; d, activities and participation; e, environmental factors; nc, not covered; nd, not definable; pf, personal factors.

basis of participants' recommendations and ICF classification. For example, although the factors "evaluator gives support and relationship," "evaluator's expertise," and "attitudes of health professionals" are often considered as a single factor, "test evaluator," in our study, we considered these 3 factors separately. Choosing a different framework might have led to a different ranking order. Yet, like a previous study,[21] we used ICF-linking rules, and 2 authors independently analyzed the factors to limit analysis bias. Furthermore, changing the 60% cutoff point in the second round analysis might have changed the final results, although other studies[49,50] were more strict in setting their cutoff points to 75% to 80% agreement.

Patient Inclusion

Patients participated only in the first round of the study. We viewed clinicians as experts in evaluating FCEs by virtue of their mastery in their clinical practice. Similarly, we viewed scientists as experts of the scientific literature by virtue of their mastery of the literature and of their professional interaction with other scientists (eg, by means of congresses). On the other hand, we viewed patients as experts in experiencing FCEs by virtue of their personal experience. Thus, we included patients in our Delphi study because, owing to their unique perspective, they might have generated new factors that were not mentioned by the other experts.

Previous studies[51,52] have validated the Delphi results of clinicians and scientists on patient groups, resulting in 55% and 71% new factors, respectively. Contrary to these studies, we decided to invite patients to participate in the first round in order to enrich our knowledge about patients' experiences early on in the study. To our knowledge, inclusion of these 3 groups simultaneously has not been done before. A supplementary factor that was described by the patient group was "mental stress because of the care of

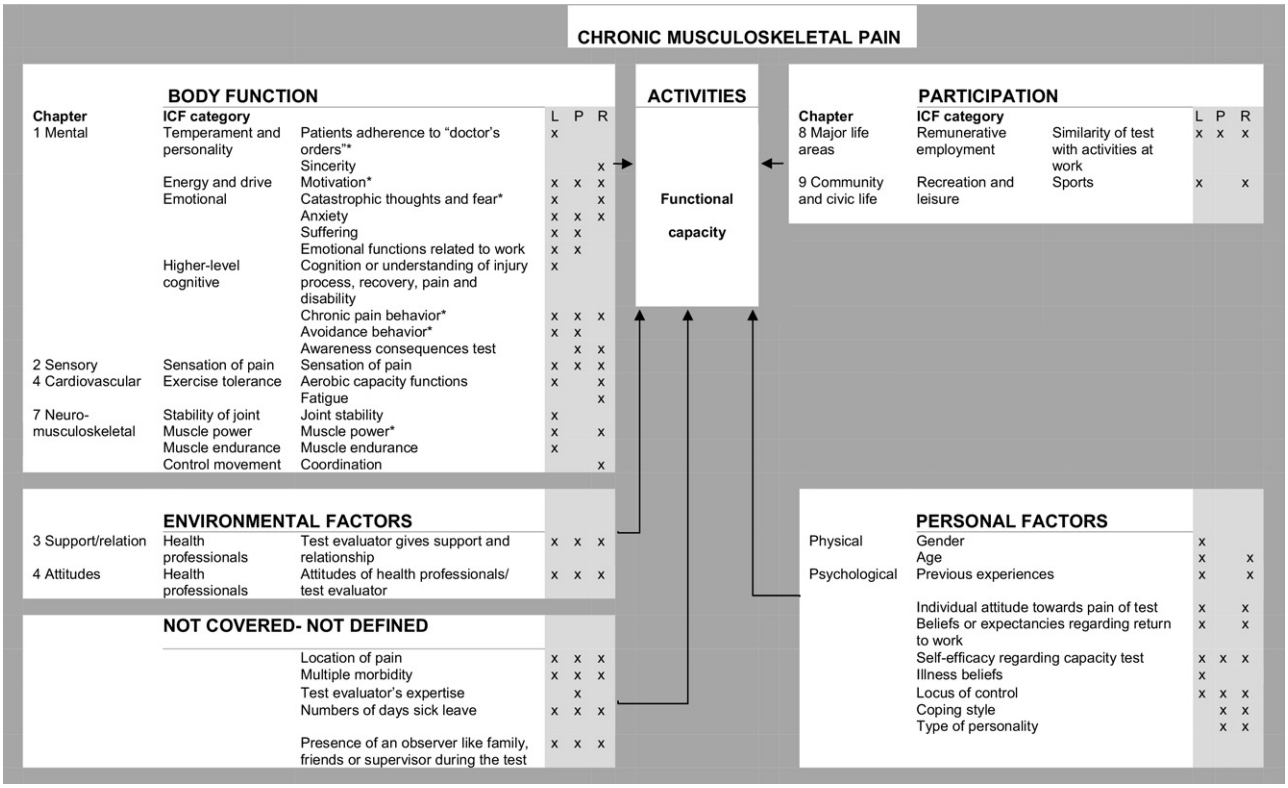

Fig 4. Factors influencing FC: moderate (25%–49%) versus severe (50%–95%). "∗" indicates factors with severe influence (50%–95%); all other factors were rated as moderate influence (25%–49%). Abbreviations: L, lifting; P, postural tolerance; R, repetitive movements.

pubertal children or other dependent family members." Assisting household members, such as in child care or parent care, was not mentioned by the other 2 expert groups and was therefore a unique contribution of the patient group. However, the clinicians and scientists eliminated this factor in the second round.

Strength of the Study

In general, the strength of Delphi studies lies in the absence of group dynamics and hierarchical structures, which are often seen in focus group meetings.[25,47,53,54] We approached scientists, clinicians, and patients in the field of FCE from all over the world. Their opinion was combined in group consensus. We stress the importance of this group consensus. There is considerable research interest in the ICF activity level. The results of this study might lead to new research areas and conformity of confounders. The ICF gives clear definitions of variables. As a consequence, the results of future FCE studies might be summarized. Finally, the most important feature of this study is its high response rate of 93%,[55] which supports the validity of the set of factors influencing FC.

CONCLUSIONS

The participants reached consensus on 6 factors that exert strong influence on lifting in patients with chronic nonspecific MSP: catastrophic thoughts and fear, patient adherence to "doctor's orders," motivation, muscle power, chronic pain behavior, and avoidance behavior. The factors motivation and chronic pain behavior, in addition to the factor sensation of pain, were identified as the most important factors to influence postural tolerance and repetitive movements tests, at a moderate level. We recommend that scientists consider all these factors for further research. In addition, we recommend that clinicians consider these factors in their clinical decision-making process.

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APPENDIX 1: THIRD-ROUND FACTORS, ICF CATEGORIES, AND ADDITIONAL INFORMATION

Factor		ICF Category	Additional Information
Body functions			
Patient adherence to "doctor's orders"	b126	Temperament and personality functions	Patient adherence to "doctor's orders" stating that physical activity should be limited. Adherence means devotion.
Sincerity	b126	Temperament and personality functions	Being open and truthful
External motivation	b1303	Energy and drive functions	Mental functions that produce the incentive to act; the conscious or unconscious driving force for action. Based on (1) financial rewards (money that you receive for working) or (2) motivation to return to highly wanted work (or to be released from unpleasant work)
Internal motivation	b1303	Energy and drive functions	Based on (1) effort (use of physical or mental energy, hard work, "he got an 'A' for effort," exertion); (2) competitive behavior (direct struggle between individuals for environmental necessities or for a common goal); or (3) ambition (strong desire for success)
Anxiety	b152	Emotional functions	A state of apprehension, uncertainty, and fear resulting from the anticipation of a realistic or fantasized threatening event or situation, often impairing physical and psychological functioning
Catastrophic thoughts and fear of reinjury, pain, movement, activities, exacerbating symptoms	b152	Emotional functions	People who catastrophize about pain have extremely and exaggeratedly negative beliefs about pain, thinking the worst about pain and appraising pain as very threatening (fear avoidance model).[56] Fear is a feeling of agitation and anxiety caused by the presence or imminence of danger.
Suffering	b152	Emotional functions	Feelings of mental or physical pain

APPENDIX 1: THIRD-ROUND FACTORS, ICF CATEGORIES, AND ADDITIONAL INFORMATION (Cont'd)

Factor		ICF Category	Additional Information
Cognition or knowledge of understanding of injury process, recovery, pain, and disability	b164	Higher-level cognitive functions	
Chronic pain behavior	b164	Higher-level cognitive functions	Chronic pain behavior is the overt, motoric factor of chronic pain syndrome and is defined as the interaction between the chronic pain patient and his/her direct environment.[38]
Avoidance behavior	b164	Higher-level cognitive functions	Fear avoidance is the avoidance of movements or activities based on fear.[39]
Awareness of consequences of the test	b164	Higher-level cognitive functions	
Sensation of pain	b280	Sensation of pain	
Aerobic capacity functions	b4551	Exercise tolerance functions	Aerobic capacity functions relate to the extent to which a person can exercise without getting out of breath.
Fatigue	b4552	Exercise tolerance functions	Functions related to susceptibility to fatigue, at any level of exertion
Joint stability	b715	Stability of joint functions	
Muscle power	b730	Muscle power functions	
Muscle endurance	b740	Muscle endurance functions	Functions related to sustained muscle contraction for the required period
Coordination	b7601	Control of voluntary movement functions	Control of voluntary movement functions. Functions associated with control over and coordination of complex voluntary movements
Activities and participation			
Similarity of capacity test with activities at work	d850	Remunerative employment	
Sports	d9201	Sports	
Environmental factors			
Test evaluator gives support and relationship	e355	Health professionals	Includes instruction, feedback, encouragement, doctor-patient confidentiality, but also the quality of the relationship, the amount of interaction with the patient, and the appropriateness of communication
Attitudes of health professionals, including the test evaluator	e450	Individual attitudes of health professionals	
Personal factors			
Psychological			
Type of personality	pf		Lazy, active
Illness beliefs	pf		Beliefs regarding illness. The common sense model describes the representations of an illness with existing schemata (the normative guidelines that people hold), enabling the patients to make sense of their symptoms and to guide them in any coping actions. Cameron and Leventhal[57] described 5 components of these illness representations: identity, cause, time line, consequences, curability/controllability. Classified according to Cieza et al[18]
Health and pain beliefs	pf		Something believed or accepted as true

APPENDIX 1: THIRD-ROUND FACTORS, ICF CATEGORIES, AND ADDITIONAL INFORMATION (Cont'd)

Factor	ICF Category	Additional Information
Self-efficacy regarding capacity test	pf	Belief that one is capable of performing the capacity test in a certain manner to attain certain goals
Beliefs or expectancies regarding return to work	pf	
Locus of control	pf	"Locus of control" refers to the extent to which individuals believe they can control events that affect them. "Internal control" is the term used to describe the belief that control of future outcomes resides primarily in oneself, while "external control" refers to the expectancy that control is outside oneself, either in the hands of powerful other people or due to fate/chance.
Individual attitude toward pain and/or capacity test	pf	An attitude is a disposition to respond favorably or unfavorably to an object, person, institution, or event.[58]
Coping style/maladaptive coping strategies	pf	Coping style is a person's characteristic strategies used in response to life problems, stressful events, or traumas. These can include thoughts, emotions, or behaviors.
Previous experiences with pain, injuries, acceptance, activity limitations after previous capacity test, previous behavior of another person in pain	pf	Previous experiences with pain and injuries, such as duration or recovery time from pain or injuries, the successfulness of previous rehabilitation efforts, and periods of pain in the last weeks or months. Previous experiences with acceptance activity limitations after capacity testing
Personal factors		
Physical		
Gender	pf	
Age	pf	
Multiple morbidity	nd	Other diseases
Numbers of days sick leave	nc	
Location of pain	nc	
Test evaluator's expertise	nc	Expertise is skill or knowledge in a particular area.
Presence of an observer like family, friends, or supervisor during the test	nc	

Abbreviations: b, body functions; d, activities and participation; e, environmental factors; nc, not covered; nd, not definable; pf, personal factors.

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